

removing the titanium layer, and if any cobalt has not reacted with the silicon then removing the unreacted cobalt.

2. (Canceled)

3. (Previously presented) The method of Claim 1 wherein during the titanium layer deposition the distance between a titanium target and the body is at least 140 mm.

4. (Previously presented) The method of Claim 1 wherein the titanium layer is at most 7.5 nm thick.

5. (Previously presented) The method of Claim 1 wherein said silicon surface is located at a bottom of an opening having an aspect ratio of at least 2.5.

6. (Previously presented) The method of Claim 5 wherein at least part of a sidewall surface of the opening is made of a dielectric.

7. (Previously presented) The method of Claim 1 wherein the titanium layer is deposited on the cobalt layer to be in contact with the cobalt layer.

8. (Previously presented) A method comprising:

forming a cobalt layer over a body that comprises silicon;

forming a titanium layer over the cobalt layer by ionized physical vapor deposition;

reacting cobalt of the cobalt layer with silicon of the body to form a cobalt silicide layer; and

substantially removing the titanium layer and any unreacted cobalt of the cobalt layer.

9. (Previously presented) The method of Claim 8 further including, subsequent to the removing act, heating the body and cobalt silicide layer to reduce the resistivity of the cobalt silicide layer.

10. (Previously presented) The method of Claim 9 wherein the heating act comprises rapidly thermally annealing the body and cobalt silicide layer.

Ronald J. Meetin
Attorney at Law
210 Central Avenue
Mountain View, CA
94043-4869
Tel.: 650-964-9767
Fax: 650-964-9779

11. (Previously presented) The method of Claim 8 wherein the forming acts are performed in a chamber at below-atmospheric pressure without exposing the body to atmospheric pressure between the forming acts.

12. (Previously presented) The method of Claim 8 wherein the titanium layer has a thickness of no more than 7.5 μm .

13. (Previously presented) The method of Claim 8 wherein the ionized physical vapor deposition comprises ion sputtering from a titanium target at a throw distance of at least 140 nm to the body.

14. (Previously presented) The method of Claim 8 wherein the ionized physical vapor deposition is performed in a chamber with the body situated on a pedestal coupled to a bias source that provides AC current for helping ionize gas to produce gas ions that dislodge titanium from a titanium target in the chamber.

15. (Previously presented) The method of Claim 8 wherein the ionized physical vapor deposition is performed in a chamber with the body situated on a pedestal coupled to a bias source that is turned substantially off to reduce resputtering of cobalt of the cobalt layer.

16. (Previously presented) The method of Claim 8 wherein:
the body comprises (a) a region consisting largely of silicon and (b) a silicon oxide layer extending along the silicon region;

the method includes, prior to the forming acts, removing at least part of the silicon oxide layer to substantially expose at least part of the silicon region; and

at least part of the cobalt layer is formed along the silicon region where it is substantially exposed.

17. (Previously presented) The method of Claim 8 wherein:

the body comprises (a) a region consisting largely of silicon and (b) a silicon oxide layer situated along the silicon region; and

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the reacting act includes causing oxygen in the silicon oxide layer to be dissolved by titanium of the titanium layer.

18. (Previously presented) The method of Claim 8 wherein:

the body comprises (i) a first region comprising silicon and (ii) a second region situated on the first region, an opening extending through the second region down to the first region;

the cobalt layer extends at least into the opening down to the first region; and

the titanium layer extends at least into the opening above material of the cobalt layer at the bottom of the opening.

19. (Previously presented) The method of Claim 18 wherein:

the first region comprises (a) a substrate region consisting largely of silicon and (b) a silicon oxide layer extending along the silicon substrate region at least at the bottom of the opening;

the method includes, prior to the forming acts, removing material of the silicon oxide layer at the bottom of the opening to substantially expose the silicon substrate region at the bottom of the opening; and

at least part of the cobalt layer is formed along the silicon substrate region at the bottom of the opening.

20. (Previously presented) The method of Claim 18 wherein:

the first region comprises (a) a substrate region consisting largely of silicon and (b) a silicon oxide layer extending along the silicon substrate region at least at the bottom of the opening; and

the reacting act includes causing oxygen of the silicon oxide layer at the bottom of the opening to be dissolved by titanium of the titanium layer.

21. (Previously presented) The method of Claim 18 wherein the opening has an aspect ratio of at least 1.3.

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22. (Previously presented) The method of Claim 18 wherein the opening has an aspect ratio of at least 2.5.

23. (Previously presented) The method of Claim 8 wherein:
the body comprises an erasable programmable read-only memory region; and
the cobalt silicide layer is formed to contact a doped silicon section of the erasable programmable read-only memory region.

24. (Previously presented) The method of Claim 8 wherein:
the body comprises an erasable programmable read-only memory region that includes (i) a first section comprising doped monocrystalline silicon and (ii) a second section situated on the first section, an opening extending through the second section down to the first section; and
the cobalt silicide layer is formed to contact the first section at the bottom of the opening.

25. (Previously presented) The method of Claim 24 wherein the first section is a surface layer of the erasable programmable read-only memory region.

26. (Previously presented) The method of Claim 23 wherein the doped silicon section comprises doped monocrystalline silicon.

27. (Currently amended) The method of Claim 8 wherein:
the body comprises (a) a doped monocrystalline silicon substrate, (b) a floating gate overlying the substrate, (c) a control gate overlying the floating gate, and (d) electrically insulating material which surrounds the floating gate and separates the floating and control gates from each other and from the substrate; and
the cobalt silicide layer is formed to contact the substrate.

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28. (Previously presented) The method of Claim 27 wherein:

the substrate comprises a pair of source/drain regions and a body region that (a) separates the source/drain regions from each other and (b) forms a pn junction with each source/drain region, the floating gate extending partially over at least one of the source/drain regions;

the cobalt silicide layer is formed to contact one of the source/drain regions.

29. (Currently amended) The method of Claim 28 wherein a floating-gate transistor of a memory cell of an erasable programmable read-only memory is comprised by the source/drain and body regions and the floating and control gates.

30. (Previously presented) The method of Claim 28 wherein the floating gate extends partially over only one of the source/drain regions.

31. (Previously presented) The method of Claim 28 further including:

forming a further cobalt layer over the other of the source/drain regions;

forming a further titanium layer over the further cobalt layer by ionized physical vapor deposition;

reacting cobalt of the further cobalt layer with silicon of that other of the source/drain regions to form a further cobalt silicide layer; and

substantially removing the further titanium layer and any unreacted cobalt of the further cobalt layer.

32. (Currently amended) The method of Claim 27 wherein the body includes (a) a select gate overlying the substrate generally lateral to the floating gate and (b) electrically insulating material which separates the select gate from the floating and control ~~other~~ gates and from the substrate.

33. (Previously presented) The method of Claim 32 wherein:

the substrate comprises a pair of source/drain regions and a body region that (a) separates the source/drain regions from each other and (b) forms a pn junction with each

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source/drain region, the floating gate extending partially over one of the source/drain regions, the select gate extending partially over the other of the source/drain regions; and

the cobalt silicide layer is formed to contact one of the source/drain regions.

34. (Currently amended) The method of Claim 33 wherein a floating-gate transistor of a memory cell of an erasable programmable read-only memory is comprised by the source/drain and body regions and the floating, control, and select gates.

35. (Previously presented) The method of Claim 33 further including:

forming a further cobalt layer over the other of the source/drain regions;

forming a further titanium layer over the further cobalt layer by ionized physical vapor deposition;

reacting cobalt of the further cobalt layer with silicon of that other of the source/drain regions to form a further cobalt silicide layer; and

substantially removing the further titanium layer and any unreacted cobalt of the further cobalt layer.

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